

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION**

CHEETAH OMNI LLC,

Plaintiff,

v.

SAMSUNG ELECTRONICS AMERICA, INC.,
and MITSUBISHI DIGITAL ELECTRONICS
AMERICA, INC.

Defendants.

CIVIL ACTION NO. 6:08-CV-279 (LED)

JURY TRIAL DEMANDED

DEFENDANTS' RESPONSIVE CLAIM CONSTRUCTION BRIEF

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In an effort to obtain expansive claim constructions, Plaintiff Cheetah Omni LLC ignores the plain meaning of the disputed terms, as well as repeated and unambiguous statements in the specifications that directly undermine its proposed constructions. The patents' specifications — including *every* embodiment of both patents — indicate that the patents relate solely to optical telecommunications systems. They have nothing to do with, and do not even mention, displays or televisions, the accused products. Cheetah's constructions rely on erroneous readings of the prosecution histories and are contrary to well-established Federal Circuit precedent regarding the primacy of the patents' claims and specifications. Defendants' constructions, which are based on the plain meaning of the terms and are supported by the specifications, should be adopted.¹ A chart of the parties' proposed constructions is attached as Appendix A.

BACKGROUND

The specifications of the asserted patents — U.S. Patents Nos. 7,116,862 (“the ’862 patent”) [Ex. A] and 7,339,714 (“the ’714 patent”) [Ex. B] — clearly define the patents' scope. For example, the “Technical Field of the Invention” section of the ’862 patent provides:

The present invention relates to the *field of communications systems*, and more particularly to an apparatus and method for providing gain equalization to optical signals carrying a plurality of wavelengths.

’862 patent at 1:24-28 (emphasis added). Likewise, the “Overview” section of the ’714 patent specifies that it relates to signal processing of the “information communicated” through optical communications systems. ’714 patent at 1:28-29. Such unambiguous statements — which Cheetah ignores — limit the proper scope of both patents. *See* MPEP § 608.01(c) (“The statement [of the Technical Field of the Invention] should be directed to the subject matter of the claimed invention.”); 37 C.F.R. § 1.73 (“A brief summary of the invention *indicating its nature*

¹ Cheetah claims in its brief that it “commercializes innovative optics, photonics and semiconductor products for a diverse range of applications” (Pl.’s Br. at 1). But Cheetah’s response to Mitsubishi’s Interrogatory Number 9 said that Cheetah “has not ‘commercialized’ the inventions claimed in the Patents-in-Suit.” [Ex. C.]

and substance . . . should precede the detailed description. Such summary should, when set forth, be commensurate with the invention as claimed and any object recited should be that of the invention as claimed.") (emphasis added); *Ciena Corp. v. Nortel Networks Inc.*, No. 2:05-CV-14, 2006 WL 1133798, at *11 (E.D. Tex. Apr. 25, 2006) (Davis, J.) ("Statements found in the summary portion of the specification are not limited to describing a preferred embodiment of the invention but more broadly describe the overall invention itself."). Cheetah proposes constructions that bear no relation to what is taught by the asserted patents — and indeed no relationship to the field of art of the asserted patents.

A. The '862 Patent

The '862 patent is directed to optical communications systems, as the patent's specification, including its binding summary portions, makes clear:

- As discussed above, the "Technical Field of the Invention" provides that "[t]he present invention relates to the field of *communication systems*, and more particularly to an apparatus and method for providing gain equalization to optical signals carrying a plurality of wavelengths" '862 patent at 1:24-28 (emphasis added).
- The "Background of the Invention" provides that "[v]arious conditions in *optical communication systems* make it desirable to be able to selectively attenuate one or more particular wavelengths in an optical signal relative to other wavelengths in that signal," *id.* at 1:31-34 (emphasis added), and notes that "[o]ne particular problem that can arise in an *optical communication system* supporting many wavelengths involves controlling the gain tilt in the transmitted signal." *Id.* at 1:44-46 (emphasis added).
- The "Summary of the Invention" discusses "[t]he present invention," including the most important of the described embodiments, a gain equalizer and a variable attenuator. '862 patent at 1:65-2:65. Those embodiments address "gain tilt" or distortion of the optical signal as it travels through long-distance optical fibers. The Summary claims that "the invention provides an effective and cost efficient mechanism for dynamically adjusting the gain tilt in a multiple band *communication system*, while maintaining an acceptable optical signal to noise ratio." *Id.* at 2:66-3:2 (emphasis added).

In contrast, the patent contains *no* indication that it has anything to do with the very different field of display technology. A display is not mentioned even once in the patent. Indeed, the patent specifically references the use of piston-like devices to process *non-visible* wavelengths. *See id.* at 1:44-54; Abstract.

B. The '714 Patent

The '714 patent similarly relates to the processing of the “information communicated” through optical communications systems using a specific device, a “variable blazed grating.” '714 patent at 1:28-29 (Overview); *id.* at 12:16-17 (discussing switching rate of information in the form of data packets); *id.* at 20:16-18 (touting “significant cost savings in processing *signals carrying information* on multiple channels or wavelengths”) (emphasis added). *Every* stated embodiment, such as “variable attenuators, gain equalizers, optical switches, and optical add/drop multiplexers,” *id.* at 6:43-49 — each of which uses a variable blazed grating — relates to optical communications systems. Just like the '862 patent, there is not a single reference to displays in the entire patent.

Indeed, the grandparent of the '714 patent — which Cheetah has stated “has an identical written description” to that of the '714 patent, *see* Ex. C — states in the Technical Field of the Invention that “[t]he present invention relates to the field of communication systems.” U.S. Patent No. 6,721,473 at 1:10-15 [Ex. D] (emphasis added). Like the '714 patent, this patent contains no indication that it has anything to do with displays.²

ARGUMENT

I. Cheetah's Approach to Claim Construction Is Severely Flawed

Contrary to the Federal Circuit's clear instructions, Cheetah's brief gives short shrift to the plain meaning of the claim terms and the disclosures of the patents, never once citing the key provisions in their Technical Field of the Invention, Overview, and Summary of the Invention sections to support its arguments. The claim language and the summary portions of the patents, however, are central to claim construction. As the Federal Circuit explained in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (*en banc*), the usage of a term in the specification

² The PTO indicated that the '714 patent family is directed toward optical communications networks, not displays. In the Reasons for Allowance of the parent patent, the disclosed invention is described as an “improvement over conventional *optical communication networks which transmit information* in the optical domain.” Dec. 28, 2004 (emphasis added) [Ex. E].

“is usually . . . dispositive [and] is the single best guide to the meaning of a disputed term.” *Id.* at 1321 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

According to the Federal Circuit, the “claims *must* be construed so as to be consistent with the specification, of which they are a part.” *Id.* at 1316 (citing 35 U.S.C. § 112, ¶ 1’s admonition that the “specification must describe the claimed invention in ‘full, clear, concise, and exact terms’”) (emphasis added). Proposed constructions that “divorc[e] the claim language from the specification” are improper and must be rejected. *Id.* at 1324.

Claim terms are generally given their ordinary and customary meaning to a skilled artisan in the field of the invention, *Phillips*, 415 F.3d at 1312-13, but where the scope of a claim term is in dispute, relying on the “plain meaning” without consideration of the specification is insufficient. *See O2 Micro Int’l Ltd. v. Beyond Innovation Tech., Ltd.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008). After all, the specification sets the outer boundaries for the permissible scope of the claims because claim terms cannot be given a broader scope than what is described or enabled. *On Demand Mach. Corp. v. Ingram Indus., Inc.*, 442 F.3d 1331, 1338 (Fed. Cir. 2006) (“[T]he scope and outer boundary of claims is set by the patentee’s description of his invention.”).³ Construing the claims in harmony with the invention taught in the specification guarantees that the scope of monopoly provided by patent rights “does not overreach the scope of the inventor’s contribution to the field of art as described in the patent specification.” *Reiffin v. Microsoft Corp.*, 214 F.3d 1342, 1345-46 (Fed. Cir. 2000) (citation omitted).

As Cheetah seeks to extend the scope of its patents to cover display technology — which is not discussed or mentioned in either patent — it is not surprising that Cheetah chose to ignore both specifications in its technology tutorial and claim construction brief. Instead, Cheetah

³ *See also Nat’l Recovery Techs., Inc. v. Netic Separation Sys., Inc.*, 166 F.3d 1190, 1196 (Fed. Cir. 1999) (“The scope of the claims must be less than or equal to the scope of the enablement.”); *Automotive Tech. Int’l, Inc. v. BMW of N. Am.*, 501 F.3d 1274, 1285 (Fed. Cir. 2007) (“[T]he specification must enable the full scope of the claims”).

places primary reliance on citations to display references in the '714 prosecution history⁴ — despite the Federal Circuit's admonition that the prosecution history "often lacks the clarity of the specification and thus is less useful for claim construction purposes." *Phillips*, 415 F.3d at 1317. The prosecution history may "inform the meaning of the claim language by demonstrating *how the inventor understood the invention* and whether the inventor limited the invention in the course of prosecution, making the claim scope *narrower* than it would otherwise be." *Id.* at 1317 (emphasis added). But it cannot *expand* the scope of the claims beyond what is disclosed in the specification, as Cheetah attempts to do here. *See Biogen, Inc. v. Berlex Labs.*, 318 F.3d 1132, 1140 (Fed. Cir. 2003) ("Representations during prosecution cannot enlarge the content of the specification . . .").

Moreover, the '714 file history does not indicate that *Islam* (the applicant) understood his claims to encompass displays. To the contrary, in response to the examiner's rejections based on display art, Islam twice refused to acquiesce to anything the examiner said in the rejections:

All of Applicant's arguments and amendments are without prejudice or disclaimer. Additionally, Applicant has merely discussed example distinctions Applicants reserve the right to discuss these additional distinctions in a later Response or on Appeal, if appropriate. By not responding to additional statements made by the Examiner, Applicants do not acquiesce to the Examiner's additional statements.

Response at 10 (Oct. 26, 2006) [Ex. F]; Response at 11-12 (Apr. 17, 2007) [Ex. G].⁵

Cheetah's emphasis on the examiner's rejections is further misplaced because the examiner's "mode of claim interpretation [is different than that] used by courts in litigation,

⁴ Cheetah's argument has no bearing on the '862 patent. The examiner of the '862 patent and its predecessor applications did not cite any display references.

⁵ Contrary to Cheetah's assertion that the patents relate to DLP displays, Islam did not cite any DLP (Digital Light Processing, the technology used in the accused products and developed by Texas Instruments decades ago) display references to the PTO until nearly four years after the original grandparent filing, which Cheetah asserts "has an identical written description" to that of the '714 patent, [Ex. C], and then only after Islam formulated his plan to sue display manufacturers in mid-2004 [Ex. H]. In stark contrast, Islam filed Information Disclosure Statements containing *hundreds* of optical communications references.

when interpreting the claims of issued patents in connection with determinations of infringement or validity.” *In re Zletz*, 893 F.2d 319, 321 (Fed. Cir. 1989). As the PTO’s Manual of Patent Examining Procedure directed the ’714 examiner when he made his initial rejections:

While the claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims must be interpreted as broadly as their terms reasonably allow.

MPEP § 2111.01 (Rev. 3, Aug. 2005) [Ex. I] (emphasis in original). The ’714 examiner never referred to the technical meaning of the claim terms or to the ’714 specification when making his rejections and indeed never provided any claim construction at all. To the extent any claim construction was implicitly applied, it appears the examiner interpreted the terms as broadly as the bounds of English would allow. This Court, however, must interpret the disputed terms based on an “objective test of what one of ordinary skill . . . would have understood the term[s] to mean,” *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 986 (Fed. Cir. 1995) (*en banc*), *aff’d*, 517 U.S. 370 (1996), and use the “specification [as] the primary basis for construing the claims,” *Phillips*, 415 F.3d at 1315 (internal quotation omitted).

II. ’862 Patent Claim Terms

A. “optical signal for processing” [claim 13]

Cheetah’s Construction	Defendants’ Construction
Light of more than one wavelength.	“light beam carrying information”

The parties agree that an optical signal involves light, but they disagree as to whether the light must carry information. The Federal Circuit has stated, however, that “a ‘signal’ implies signaling—that is, the conveyance of information.” *In re Nuijten*, 500 F.3d 1346, 1353 (Fed. Cir. 2007). “[I]n order to be a ‘signal,’ as required by the claim, some carrier *upon which the information is embedded* is required.” *Id.* (emphasis added). Accordingly, based on the Federal Circuit’s common-sense reading, which did not rest on any particular usage in the patent at issue,

a “signal” must convey information. *Id.* Other courts have reached the same conclusion.⁶

Moreover, that a “signal” carries information is consistent with common sense and plain meaning. *See Newton’s Telecom Dictionary* 799 (16½th ed. 2000) (“Signal[:] An electrical wave used to convey information.”) [Ex. J]. Cheetah offers no evidence that the term “optical signal” is used in the art to simply mean “light.”

A construction requiring that the “signal” carry information also is consistent with the patent specification. For example, the Technical Field of the Invention section states that the patent “relates to the field of communication systems.” ’862 patent at 1:25-26. Obviously, there is no “communication” unless information is being communicated. Likewise, the Background of the Invention section explains that “optical communications systems have typically been limited to using the conventional [] band of wavelengths to communicate optical signals.” *Id.* at 1:46-49. As is well-understood in the art, a “communications system” must “communicate” something, namely information. *See id.* at 29:42-62 (“To meet the ever increasing bandwidth demands of current and future communication systems, optical communication systems often *communicate information using multiple wavelengths multiplexed into one or several optical signals.*”) (emphasis added); *id.* at 31:46-51 (“optical communication typically involves combining an *optical signal carrying desired information* (an incident signal) with a higher power signal from a local oscillator”) (emphasis added). Cheetah has not identified anything in the ’862 patent suggesting that the patent intends a unique definition of “optical signal” that does not involve the carrying of information. *See id.* at 35:54-57 (“This aspect of the invention provides significant cost savings in processing *signals carrying information* on multiple channels or wavelengths”) (emphasis added); *id.* at 40:14 (same).

Cheetah’s proposed construction that “optical signal” is “light” also should be rejected

⁶ *See, e.g., Broadcast Innovation, LLC v. Echostar Commc’n Corp.*, 240 F. Supp. 2d 1127, 1151 (D. Colo. 2003) (construing “signal” to mean “an impulse by which messages or information can be transmitted”).

because it renders the term “signal” meaningless. *See Bicon, Inc. v. The Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006) (“Allowing a patentee to argue that physical structures and characteristics specifically described in a claim are merely superfluous would render the scope of the patent ambiguous, leaving examiners and the public to guess about which claim language the drafter deems necessary to his claimed invention and which language is merely superfluous, non-limiting elaboration”).

Finally, Cheetah’s construction does not correspond to the ordinary technical meaning of the term. Under Cheetah’s construction, “optical signal” includes sunlight, candlelight, moonlight, x-rays, flashes from a firefly, and the light that the Court currently is using to illuminate this brief. Neither common sense nor the claims nor the specification of the ’862 patent permits such an outcome.

In short, the plain meaning of “optical signal” — as recognized by technical dictionaries, the Federal Circuit, and the patent — requires the transmittal of information. This is the only construction that is consistent with the claims and specification of the ’862 patent.

B. “comprising a plurality of wavelengths” [claim 13]

Cheetah’s Construction	Defendants’ Construction
Light of more than one wavelength.	“comprising multiple communications channels”

The parties disagree whether the “wavelengths” that are separated, divided, and received in the steps of claim 13 must be discrete wavelength channels (Defendants’ position), or whether they may be arbitrarily selected groups of waves from a continuous spectrum of light from a source such as the sun (Cheetah’s position). The plain meaning of “wavelength” in the optical communications field, as well as the ’862 patent’s specification, supports Defendants’ position.

One of skill in the art of optical communications understands “wavelength” to refer to a channel carrying an optical signal in a modern optical communication system. According to *Newton’s Telecom Dictionary*, “[e]ach wavelength is a ‘virtual channel’, effectively a separate ‘light pipe’” *Newton’s Telecom Dictionary* 984-85 (16½th ed. 2000) [Ex. K]. In fact, the terms “wavelength” and “channel” are used interchangeably in the field of optical

communications. *Newton's* states, for example: "At OC-192, a *40-channel* system would yield an incredible 400 Gbps, rounded up. . . . Within the next 2-3 years it is reasonable to expect to see systems supporting on the order of *100 wavelengths* of OC-192 each, providing almost one terabit per second transport!" *Id.* at 984 (emphasis added).

The '862 specification confirms that "wavelength" refers to a channel in a modern optical communication system. The "Background of the Invention" section explains that such systems "strive to implement more and more *wavelength channels*." '862 patent at 1:41-43 (emphasis added); *see id.* 35:54-57 ("This aspect of the invention provides significant cost savings in processing signals carrying information on *multiple channels or wavelengths*.") (emphasis added). It then identifies the problem addressed by the invention: "[a]s additional wavelength bands are utilized . . . longer *wavelength channels* can rob power from the shorter *wavelength channels*, creating a gain tilt." *Id.* at 1:56-59 (emphasis added). The patent's solution is to separate the wavelength channels from one another, so that the amplitude of the various wavelength channels can be individually adjusted. *Id.* at 2:2-4 (Summary of the Invention) (discussing "separat[ing] one or more *communications bands* into a plurality of wavelengths") (emphasis added); 27:13-16 ("In operation, wavelength division demultiplexer receives an optical input signal having a plurality of wavelengths, and separates signal into a plurality of individual wavelength signals").⁷ The '862 patent never suggests that the claimed invention applies to light that is not made up of wavelength channels in an optical communication system and never even mentions such light. Thus, the Court should adopt Defendants' construction.

⁷ The usage of the term "wavelengths" throughout the specification confirms that "wavelength" means a particular wavelength channel. *See, e.g.*, '862 patent at 26:33-36 ("As optical systems use more and more communication channels (using more and more wavelengths), the cost of PMD compensation using conventional equipment quickly becomes prohibitive"); *id.* at 27:13-16 ("In operation, wavelength division multiplexer 802 receives an optical input signal 816 having a plurality of wavelengths, and separates signal 816 into a plurality of individual wavelength signals 806a-806n.").

C. “separating the optical signal communicated for processing into at least a first portion of optical signal wavelengths and a second portion optical [sic] wavelengths” [claim 13]

Cheetah’s Construction	Defendants’ Construction
Separating the optical signal into two or more wavelengths.	“separating the ‘optical signal’ into at least two groups of wavelengths, each containing different communication channels”

The parties agree that this element requires that the optical signal be physically separated into component wavelengths. However, the parties disagree as to whether the wavelengths that result from this step must be communications channels (*i.e.*, whether they must convey information). As discussed above in Sections II.A and II.B, the optical signal must convey information, and the wavelengths in an optical signal are communications channels. Thus, the “separating” step physically splits a signal that already consists of multiple communications channels into its constituent channels.

The prosecution history of the ’862 patent supports this conclusion. During prosecution, the examiner challenged whether “separating” was disclosed at any point in the specification. *See* Office Action at 2 (mailed Aug. 5, 2005) [Ex. L] (“[i]t appears that the specification does not provide proper antecedent basis for the term ‘separator’”). The applicant responded that “a separator is shown at least by the unlabeled wavelength division demultiplexer (*e.g.*, a separator).” Response at 10 (Nov. 1, 2005) [Ex. M]. The wavelength division multiplexer is the only structure identified during prosecution that performs the separating function, and, as well understood, a wavelength division multiplexer “receives [an] input signal and demultiplexes that signal into a plurality of wavelength signals [*i.e.*, communications channels]”). ’862 patent at 36:63-65.⁸ Therefore, the separator recited in claim 13 divides the optical signal into one or more groups of wavelength channels. Cheetah’s effort to eliminate the requirement that the wavelengths contain communication channels should be rejected.

⁸ Each embodiment cited by Cheetah for its argument that the “separating” step simply separates “wavelengths” actually involves separating different “wavelength signals,” *i.e.*, channels (Pl.’s Br. at 18 (citing ’862 patent at 28:49-52, 31:31-36)), and therefore support Defendants’ position.

D. “receiving at least the first portion of optical signal wavelengths” [claim 13]

Cheetah’s Construction	Defendants’ Construction
Cheetah agrees with the defendants’ construction, so long as it does not prohibit further light processing (e.g. the “dividing” step) after the “separating” and before the light is received at the moveable mirror.	“receiving at least the ‘ <i>first portion of optical signal wavelengths</i> ’ that is recited in the ‘separating’ step”

Defendants’ constructions of the “dividing” and “receiving” limitations rest on the plain language of claim 13, which reads in principal part:

communicating **an optical signal for processing**, the optical signal comprising a plurality of wavelengths; [**the “communicating” step**]

separating the **optical signal communicated for processing** into at least **a first portion of optical signal wavelengths** and a second portion [*sic* -of] optical signal wavelengths; [**the “separating” step**]

dividing at least **a portion of the optical signal communicated for processing** into at least a first part and a second part, wherein the first part comprises an amplitude that is different than an amplitude of the second part; [**the “dividing” step**]

receiving at least **the first portion of optical signal wavelengths** at a moveable mirror of a micro-electro-optic system (MEMS) device; [**the “receiving” step**]

reflecting **the first portion of optical signal wavelengths** from the moveable mirror to form at least one MEMS output signal having an amplitude, the amplitude of the MEMS output signal capable of being changed by moving the moveable mirror. . .

As is made clear by the colored text, Claim 13 refers to both an “an optical signal for processing” (indicated in red) and “the first portion of optical signal wavelengths” (indicated in blue). The result of the “separating” step — called “the first portion of optical signal wavelengths” and indicated in blue — is later used in the “receiving” step.

Indeed, there appears to be no dispute that the term “the first portion of optical signal wavelengths” referred to in the “receiving” step means the same as the term “the first portion of optical signal wavelengths” in the “separating” step. That is, the “receiving” step receives a “portion” of the output of the separating step. It does not receive a “part,” which is the outcome of the “dividing” step. Cheetah, however, would like the Court to rewrite this claim to allow the “receiving” step to receive the output of the dividing step (a “part,” not a “portion”), contrary to

basic claim construction principles. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1356 (Fed. Cir. 1999) (“[t]he presence of that identical language” required an identical construction for the occurrence of two claim terms). Claim 15 makes clear that the moveable mirror receives the output of the “separating step” and not the “dividing” step through its use of the definite article “the.” Black letter patent law mandates that the use of “the” points back to the “first portion of optical signal wavelengths,” which is the output of the separating step. *NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1282, 1306 (Fed. Cir. 2005). This antecedent basis can be found only in the “separating” limitation, which recites “separating the optical signal communicated for processing into at least a *first portion of optical signal wavelengths*.”

Although Cheetah contends that additional processing of the “first portion of optical signal wavelengths” should be allowed after the “separating” step, there is no support for this theory. Essentially, Cheetah argues that the moveable mirror referred to in the “receiving” step should be allowed to receive something less than the “the first portion of optical signal wavelengths.” (Pl.’s Br. at 20-21.) Something less than the “the first portion of optical signal wavelengths,” however, is not “*the* first portion of optical signal wavelengths” that is referred to in the “receiving” step, any more than a slice of pie is “*the* pie.” This becomes particularly clear when the language of claim 13 is compared with claim 18 of the ’714 patent, which requires that the moveable mirror be “operable to receive at least **some of** the portion of the first signal part.” (emphasis added). If Cheetah is correct that claim 13 allows additional processing of the “the first portion of optical signal wavelengths” after the “separating” step, the “receiving” step should have referred to “*at least some of* the first portion of optical signal wavelengths” or “*a part of* the first portion of optical signal wavelengths.” But as written, the claim requires the receipt of at least the entire first portion of optical signal wavelengths from the “separating step.”

E. “dividing at least a portion of the optical signal communicated for processing into at least a first part and a second part, wherein the first part comprises an amplitude that is different than an amplitude of the second part” [claim 13]

Cheetah’s Construction	Defendants’ Construction
Dividing a portion of the optical signal from the separating step into at least two parts, where two of the parts have unequal amplitudes.	“dividing the input ‘ <i>optical signal</i> ’ into first and second copies with different amplitudes”

The parties disagree as to whether the “dividing” step can operate on a “portion” from the separating step (Cheetah’s position) or whether it must operate on a different component of the optical signal (Defendants’ position).⁹ They also disagree as to whether any division is sufficient (Cheetah’s position) or whether the division must result in *copies* (Defendants’ position).

First, Cheetah’s argument that the “dividing” step operates on “the optical signal from the separating step” conflicts with the plain language of the claim and must be rejected. As discussed above, “at least the first portion of optical signal wavelengths” from the “separating” step must be received at the moveable mirror. Therefore, the “first portion of optical signal wavelengths” cannot be further sub-divided by the “dividing” step, because if it were, the “first portion of optical signal wavelengths” would not be available to be received at the moveable mirror. Rather, the “dividing” step must be understood to operate on some component of the original optical signal *other than* “the first portion of optical signal wavelengths” from the separating step. The plain language of the claim indicates that what is divided is not the “first portion of *optical signal wavelengths*” created during the “separating” step, but rather “a portion of *the optical signal communicated for processing*” (the input signal, labeled in red in the claim language shown on page 11). Applying the Federal Circuit’s guidance that identical claim terms have identical meaning and different claim terms have different meaning defeats Cheetah’s

⁹ Mitsubishi and Samsung agree that the “dividing” step cannot operate on “the first portion of optical signal wavelengths” from the “separating” step. Samsung further believes the “dividing” step cannot operate on any portion of “optical signal wavelengths” from the “separating” step. Mitsubishi believes the “dividing” step may operate on a remaining portion of the “optical signal for processing” other than the “first portion of optical signal wavelengths” from the “separating” step, which must be preserved to be received at the moveable mirror.

argument that the “dividing” step can operate on a “portion of optical signal wavelengths.”¹⁰

The applicants chose the words in the claim, and cannot now argue that “a first portion of optical signal wavelengths” means the same thing as “a portion of the optical signal communicated for processing.” Any confusion that results from construing these different terms differently must lead to a finding of indefiniteness, not to a construction that departs from the clear words of the claim. *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1373-74 (Fed. Cir. 2004) (“Thus, in accord with our settled practice we construe the claim as written, not as the patentees wish they had written it.”).¹¹

Second, the specification of the ’862 patent requires that the “parts” created by the “dividing” step be copies of each other. For example, the Summary of the Invention identifies the key embodiments, which involve receiving “a first *copy* of an input signal from a beam splitter” and combining it “with a second *copy* of the input signal.” ’862 patent at 2:4-14 (emphasis added); *see also id.* at 2:25-29 (“The method further includes . . . communicating a first *copy* of the input wavelength signal toward a first reflective surface and a second *copy* of the input wavelength signal toward a second reflective surface”) (emphasis added). Likewise, the

¹⁰ *See Bd. of Regents v. BENQ Am. Corp.*, 533 F.3d 1362, 1371 (Fed. Cir. 2008) (“Different claim terms are presumed to have different meanings”; therefore, the distinction between the terms “each pre-programmed code” and “the matched one or more pre-programmed codes” in the claim was “significant”); *Warner-Lambert Co. v. Apotex Corp.*, 316 F.3d 1348, 1356 (Fed. Cir. 2003) (quotations omitted) (“it is a rule of law well established that the definite article ‘the’ particularizes the subject which it precedes”); *Phonometrics, Inc. v. No. Telecom Inc.*, 133 F.3d 1459, 1465 (Fed. Cir. 1998) (“A word or phrase used consistently throughout a claim should be interpreted consistently.”); *see also Outside Box Innovations, LLC v. Travel Caddy, Inc.*, 260 Fed. Appx. 316, 320 (Fed. Cir. 2008) (non-precedential) (references in a claim to “flexible . . . fabric panel[s]” and “fabric covered . . . panel[s]” must mean different things or the distinction drawn between them in the claim would be “meaningless”).

¹¹ Although Defendants believe claim 13 can be construed as written simply by focusing closely on the actual text of the claim, Samsung contemporaneously is filing a contingent motion for summary judgment that the claim is indefinite under 35 U.S.C. § 112, ¶ 2. Samsung believes that unless “a portion of the optical signal communicated for processing” means something different from “a first [or second] portion of optical signal wavelengths,” and unless the “first portion of optical signal wavelengths” received “at a moveable mirror” is the same “first portion of optical signal wavelengths” created in the “separating” step, the claim is incomprehensible.

beam splitter shown in the specification divides the input signal to create signal copies in every embodiment. *See, e.g.*, '862 patent, Figs. 1a-d, 2a-2c, 4, 5a-c, 6, 7a-c, 8c-h, 9, 10a-b, 11, 14c, 15, 16b-d, 17; *id.* at 5:53-62, 6:19-34; 6:55-59; 7:3-6. As explained in Defendants' technology tutorial, dividing the signal into copies in this manner is necessary in order to create the interference that is the key to how the purported invention of the '862 patent works.¹²

Cheetah argues that the principle of "claim differentiation" requires a broad construction of the "dividing" step, but this argument lacks merit. Although Cheetah argues that the presence of a "beam splitter" limitation in claims 1, 6, 8, and 18 (which Cheetah admits creates copies) "indicates that the inventors intended claim 13 to be broader," there is no such differentiation. To the contrary, the use of "beam splitter" in claims 1, 6, 8, and 18 proves that claim 13 also must create copies. This is so because claims 1, 6, 8, and 18 are *apparatus claims*, while claim 13 is a *method claim*. Indeed, claim 1 is almost identical to claim 13, except it is drafted as an apparatus claim. Thus, the most reasonable inference from the use of "beam splitter" in apparatus claim 1 is that the "dividing" step in method claim 13 likewise splits the beam into copies. Combined with the fact that claim differentiation only weakly applies between independent claims, the apparatus and method claims should be construed in parallel to require the creation of copies. *See Hormone Research Found., Inc. v. Genentech, Inc.*, 904 F.2d 1558, 1567 (Fed. Cir. 1990) ("It is not unusual that separate claims may define the invention using different terminology, especially where (as here) independent claims are involved.").

Cheetah's position also is undermined by the prosecution history of the grandparent of the '862 patent. *See Verizon Serv. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1306 (Fed.

¹² The signal copies created by the beam splitter are crucial to the patent's functionality. The invention teaches that a phase shift between the copies results in the destructive interference necessary to alter the amplitude of the output signal and accomplish the patent's purpose of gain equalization. *See* '862 patent at 6:28-33 ("The difference in signal path translates to a difference in phase between . . . [the] first and second copies . . . [which] results in an interference, which alters the amplitude of [the] output signal . . . relative to that of [the] input signal").

Cir. 2007) (“[A] statement made by the patentee during prosecution history of a patent in the same family as the patent-in-suit can operate as a disclaimer.”). During prosecution of that patent, the examiner made clear that prior art would invalidate the claim if the claim language did not limit the dividing of the signal to the creation of two copies. *See* Office Action at 4-5 (Sept. 25, 2002) [Ex. N] (stating that “the first and second wavelength signal copies (same signal split into two signals)” must be combined and that a prior art reference “do[es] not teach splitting an input signal into two copies to generate phase shifting”); Office Action at 2-3 (Mar. 27, 2003) [Ex. O] (“[T]he input signal is equally split into two optical beams by the beam splitter.”). In response, the applicants added a limitation specifying that the process must divide the input signal into “[a] first copy of the input signal and [a] second copy of the input signal” that “comprise unequal amplitudes” to ensure patentability over the prior art. *See* Response at 2-15 (June 26, 2003) [Ex. P] (emphasis added). These limitations remained in the claims throughout the prosecution of the ’862 patent family, including the ’862 patent itself.

F. “the moveable mirror is operable to move relative to the inner conductive layer” [claim 14]

Cheetah’s Construction	Defendants’ Construction
When the voltage between the moveable mirror and the inner conductive layer changes, the moveable mirror moves relative to the inner conductive layer.	“the mirror is operable to be displaced in an approximately parallel plane to the previous mirror position”

The parties disagree as to whether the mirror must be displaced in an approximately parallel plane to the previous mirror position (Defendants’ position) or whether the mirror can move in any manner (Cheetah’s position). The ’862 patent, however, states in its Abstract that the moveable mirror layer is “displaceable in a substantially piston-like motion.”¹³ The

¹³ “The abstract . . . refer[s] to the invention as a whole and not just a preferred embodiment.” *Ciena Corp. v. Nortel Networks Inc.*, 2006 WL 1133798, at *26 (E.D. Tex. 2006) (Davis, J.); *see also C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 866 (Fed. Cir. 2004) (abstract is a “[s]tatement[] of general applicability”). Thus, claim terms should be construed in light of limiting statements in abstracts. *See, e.g., id.* at 863-66 (construing “plug” to mean a pleated plug where abstract said plug was pleated); *SciMed Life Sys., Inc. v. Adv. Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1343-45 (Fed. Cir. 2001) (construing “catheter” to mean a coaxial catheter (continued...))

specification then explains that “[t]he term ‘piston-like’ motion refers to a motion in which the moveable mirror is intended to be displaced *in an approximately parallel plane to the previous mirror position.*” ’862 patent at 5:60-64 (emphasis added).

Claim 14 itself supports Defendants’ position that the motion must be piston-like. It requires that “the moveable mirror is operable to move relative to the inner conductive layer in response to a voltage difference between the moveable mirror and the inner conductive layer.” Only in the case of piston-like motion does the *entire* moveable mirror move relative to the inner conductive layer (as opposed to a part of the moveable mirror, or most of the mirror except for a stationary axis), as contemplated by the claim. Moreover, only in the case of piston-like motion can a voltage difference exist between the moveable mirror as a whole and the inner conductive layer as a whole (as opposed to a voltage difference between part of the moveable mirror and a part of the inner conductive layer), as the claim requires. In fact, every moveable mirror disclosed in the invention is operable to be displaced in an approximately parallel plane to the previous mirror position. *See id.*, Fig. 1a (moveable mirror 30a can only be displaced from position 32a to *parallel* position 34a); Fig. 1b (moveable mirror can only be displaced from position 32’ to *parallel* position 32); Fig. 1c (moveable mirror 30b can only be displaced from position 32b to *parallel* position 34b).

As explained in Defendants’ technology tutorial, each and every embodiment of the ’862 patent uses a variable attenuator unit, as depicted in Figure 1a. For the invention to work properly, the moveable mirror must communicate the first signal copy to the beam combiner, where it re-combines with the second signal copy to form an output signal. As Figure 1a shows, the first signal copy only reaches its destination (the beam combiner) at position 50a when it reflects off of mirror 30a at an angle *approximately parallel* to the mirror’s original position at

where the abstract said the catheter was coaxial); *Ciena*, 2006 WL 1133798, at *10-12, 26 (limiting scope of several claims in light of abstract).

32a. If the moveable mirror device were to rotate, for instance, the first signal copy would “misfire” and not recombine at position 50a with the second signal copy.

In its brief, Cheetah cites to the following excerpt from the specification:

In practice, for various reasons, physical embodiments of the invention may not exhibit true ‘piston-like’ motion, although such embodiments are intended to be within the scope of the invention. For example, the moveable mirror layer may be anchored at its ends and may exhibit some curvature between the anchor points as it moves from one position to another. In addition, variances in resistance across the moveable mirror layer may result in one portion of the moveable mirror layer experiencing more movement than another portion. The invention is intended to encompass these embodiments within the definition of ‘piston-like’ motion.

’862 patent at 6:4-15. This excerpt, however, does not support Cheetah’s broad construction or describe any mirror motion other than motion that is in an approximately parallel plane to the previous mirror position. Rather, it merely acknowledges the physical reality that piston-like motion might sometimes be imperfect. Defendants’ proposed construction, which quotes directly from the specification, accounts for this fact by stating that “the mirror is operable to be displaced in an *approximately* parallel plane to the previous mirror position.” *Id.* at 5:60-63 (emphasis added). Thus, Defendants’ construction gives the claims the fullest possible scope consistent with the specification.¹⁴

Cheetah asserts an erroneous claim-differentiation argument based on the inclusion of the term “piston-like motion” in a parent of the ’862 patent and the absence of the term in claim 13. The PTO has declared that the claims of the ’862 patent are “not patentably distinct from” the claims of the parent. *See* Office Action at 3 (mailed Jan. 12, 2006) [Ex. Q]. Indeed, the PTO initially rejected all claims in the ’862 application for violating the doctrine of double patenting, prompting Cheetah to file a terminal disclaimer. *Id.* at 3-4. Furthermore, the PTO noted that even claims in the parent application that did not expressly recite “piston-like motion” required it nonetheless. *See* U.S. Pat. Appl. 10/733,007, Office Action at 5 (mailed June 28, 2004) [Ex. R]

¹⁴ Cheetah argues Defendants’ construction is ambiguous. (*See* Pl.’s Br. at 23.) As Defendants’ construction quotes from the patent specification, this argument should be rejected.

(rejecting such a claim after stating it would have been obvious to use “any type of MEMs that provides the piston-type action”). Accordingly, Cheetah’s attempt to remove the requirement of “piston-like motion” from the ’862 patent should be rejected.

G. “to form at least one MEMS output signal having an amplitude” [claim 13]

Cheetah’s Construction	Defendants’ Construction
An output signal is light reflected off of the MEMS device received at the output interface.	“to form an output signal using a MEMS device that causes interference between light beams”

H. “the amplitude of the MEMS output signal capable of being changed by moving the moveable mirror” [claim 13]

Cheetah’s Construction	Defendants’ Construction
As the position of the moveable mirror changes, the amplitude of the output signal changes.	“movement of the mirror capable of causing phase shift to change the amplitude of the MEMS output signal”

These two limitations, which both relate to the characteristics of the MEMS output signal, can be addressed together. Defendants’ constructions require the output signal from the MEMS device to be the result of interference between light beams and that the change in amplitude be the result of phase shift. Cheetah seeks to eliminate these requirements.

The specification of the ’862 patent supports Defendants’ constructions. Every embodiment of the patent relies on a variable attenuator unit similar to that depicted in Figure 1a. As explained in Defendants’ technology tutorial, the device works by (1) splitting the input signal into copies; (2) adjusting the phase of the MEMS output signal by moving the moveable mirror; (3) combining the copies; and (4) using phase shift to create interference causing a change in amplitude. Cheetah does not and cannot suggest that the invention of the ’862 patent has any other manner of operation. Indeed, the amplitude of the MEMS output signal cannot be changed under Cheetah’s proposed construction — thus making it an improper construction.

The specification explains that the moveable mirror “regulate[s] . . . the intensity or attenuation of [the] output signal” ’862 patent at 7:14-16, 12:48-54, and “introduce[s] a *phase shift* between the first and second signal copies at the output.” *Id.* at 2:10-14 (emphasis added); *see also* Abstract (“[t]he moveable mirror layer is displaceable in a substantially piston-

like motion to *introduce a phase shift* between the first and second signal copies at the output”) (emphasis added). The phase shift, or change in amplitude, of the output signal is caused by “interference between the first and second . . . signal copies.” *Id.* at 2:36-41.

Cheetah argues that Defendants seek to import limitations that would exclude an embodiment. To support this argument, Cheetah relies on the embodiment disclosed in Figure 7b as an embodiment in which no interference occurs. Although Cheetah is correct that no interference occurs in Figure 7b, *there also is no amplitude change* in the output signal. *Id.* at 14:35-44. Accordingly, to the extent Figure 7b shows a “MEMS output signal” that does not undergo amplitude change because of phase shift and interference, it is not an embodiment claimed by claim 13 and, therefore, does not support Cheetah’s argument. Because “[t]here is no enabling description of how to” change the amplitude of the MEMS output signal without phase shift and interference, “and claims are best construed to preserve their validity,” Defendants’ construction should be adopted. *Medtronic Nav., Inc. v. Brainlab*, No. 06-1289, 2007 WL 387585 at *3-4 (Fed. Cir. Feb. 5, 2007).

Cheetah also incorrectly asserts that the embodiment disclosed in lines 35-44 of column 14 shows that the amplitude of the MEMS output signal can be changed without phase shift. (Pl.’s Br. at 25.) Although the amplitude of the output signal 474b is zero when there is no phase shift, any *change* to that amplitude requires phase shift. Indeed, the patent teaches that the amplitudes of the output signals in this embodiment are regulated by “appropriate combinations of mirror movements,” ’862 patent at 14:35, which either “can be operated to create no phase shift,” *id.* at 14:37-38, or “to create approximately a Pi phase difference,” *id.* at 14:57. Thus, the embodiment Cheetah cites, like all embodiments in the ’862 patent, teaches Defendants’ construction: “[m]ovement of the mirror capable of causing phase shift to change the amplitude of the MEMS output signal.”

Finally, Cheetah relies on the doctrine of claim differentiation, but this theory lacks merit. Cheetah fails to identify any teaching in the patent regarding how to change the amplitude of a signal without using phase shift and interference. Thus, when the claim states that the “output

signal [is] capable of being changed by moving the moveable mirror,” it can only mean that it does so using phase shift. *Tandon Corp. v. U.S. Int’l Trade Comm’n*, 831 F.2d 1017, 1024 (Fed. Cir. 1987) (“Whether or not claims differ from each other, one can not interpret a claim to be broader than what is contained in the specification and claims as filed.”).

I. “output interface” [claim 13]

Cheetah’s Construction	Defendants’ Construction
The portion of the system that receives the output signal.	“output port for connecting to another system or device”

An output interface is plainly an output port for connecting to another system or device. Cheetah attempts to construe “output interface” to mean “output” only, thereby rendering the term “interface” meaningless. Constructions that “render meaningless express claim limitations” are disfavored. *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1563 (Fed. Cir. 1991); *see also* *TiVo Inc. v. Echostar Comms.*, No. 2:04-CV-1, 2005 WL 6225413, at *6 (E.D. Tex. Aug. 18, 2005) (“Each term used in a claim is presumed to have meaning. Thus, a claim construction that would render terms meaningless or redundant is presumably incorrect.”) (citation omitted).

“Interface,” in the context of the technology of this invention, is well understood as a “shared boundary between two or more systems, or between two or more elements within a system, through which information is conveyed.” IEEE, *The Authoritative Dictionary of IEEE Standard Terms* 574 (7th ed. 2000) [Ex. S]; *see also* *Newton’s Telecom Dictionary* at 458 [Ex. T] (defining “interface” as “a shared boundary . . . [t]he procedures, codes, and protocols that enable two entities to interact for a meaningful exchange of information.”). Cheetah’s attempt to vary the plain meaning using prosecution history should be rejected.

III. ’714 Patent Claim Terms

A. “optical signal” [claims 18, 19]

Cheetah’s Construction	Defendants’ Construction
Light of more than one wavelength.	“light beam carrying information”

For the same reasons discussed above (at Section II.A) with respect to the ’862 patent, the term “optical signal” in the ’714 patent refers to a light beam that is carrying information.

The specification of the '714 patent confirms this conclusion. In describing the problem that the invention seeks to solve, the Overview section states:

As optical systems continue to increase the volume and speed of *information communicated*, the need for methods and apparatus operable to facilitate high speed *optical signal* processing also escalates.

'714 patent at 1:28-31 (emphasis added). The specification also explains that “the invention provides significant cost savings in processing signals *carrying information on multiple channels or wavelengths*.” *Id.* at 18:65-67 (emphasis added); *id.* at 20:16-18 (same). Accordingly, it is clear from both the common meaning of the term and the specification that the term “optical signal” requires the conveyance of information.

B. “unmodulated optical signal” [claim 18]

Cheetah’s Construction	Defendants’ Construction
Light of more than one wavelength.	“an ‘ <i>optical signal</i> ’ with characteristics of amplitude, phase, or frequency to be varied by the “array of optical signal processing devices.”

Defendants disagree with Cheetah’s construction of “optical signal” as stated in Section III.A, but accept Cheetah’s previously proposed construction that: “An unmodulated optical signal is one that has not been processed by the array of optical signal processing devices.”

C. “resulting in a reflection of the at least some of the portion of the first signal part” [claim 18] / “resulting in a reflection of the at least some of the portion of the optical signal” [claim 19]

Cheetah’s Construction	Defendants’ Construction
Rotating the mirrors to reflect at least some portion of the first signal part / of the at least some of the portion of the optical signal.	These limitations require that the “ <i>array of optical signal processing devices</i> ” operate in the disclosed “reflection mode,” i.e. redirecting light from a mirror that is parallel to the inner conductive layer.

The parties dispute whether “reflection” requires the mirrors to be in a parallel position. Defendants’ construction requires that the mirrors be in a parallel position, while Cheetah contends that the mirrors can “reflect” in any orientation, such as an angled position. Cheetah’s construction ignores the patent’s clear distinction between “reflection” and “diffraction.”

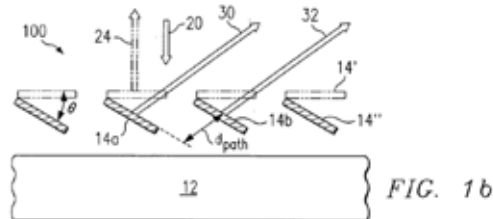
As discussed in Defendants’ technology tutorial, the '714 patent is directed toward the use of a variable blazed grating device, which consists of mirror strips that can rotate. The

different positions of the mirror strips are defined explicitly by the patent as “reflection mode” and “diffraction mode”:

Fig. 1b illustrates one example of operation of apparatus 100. In this example, strips 14 receive optical input beam 20 at an angle normal to the surface of strips 14 at position 14'. Strips 14 at position 14' (shown in dotted lines) show apparatus 100 operating in ‘*reflection mode*,’ where strips 14 operate to reflect input optical beam 20 as reflected signal 24. In this case, because input beam 20 is oriented normally to the surfaces of strips 14, reflected beam 24 is communicated back in the same direction from which input beam 20 originated. As will be discussed below, non-normal input angles could also be used.

Strips at positions 14'' (shown in solid lines) depict strips 14 during a second mode of operation, ‘*diffraction mode*.’ In diffraction mode, strips 14 are each rotated by approximately a blaze angle THETA from the original position of strips 14. . . . Input optical beam 20 impinges on strip 14a, while a second portion of beam 20 impinges on strip 14b, which is adjacent to strip 14a. While beam 20 may experience some scattering, because of the rotation of strips 14 to position 14'', the majority of the diffracted portions of input beam 20 are directed in one direction, as illustrated (at least in part) by output rays 30 and 32.

’714 patent at 4:9-37 (emphasis added). Accordingly, when in “reflection mode,” the array of strips are in a parallel position, but when in “diffraction mode,” they are in an angled position. The distinction between the two modes is shown in Figure 1b, reproduced below:



The grating is in “reflection mode” when the mirrors are flat (in position 14') and in “diffraction mode” when the mirrors are angled (in position 14'').

The distinction between “reflection” and “diffraction” is maintained throughout the specification. As the lexicographer, the patentee’s definition of terms such as these governs. *See Honeywell Int’l v. Univ. Avionics Sys. Corp.*, 493 F.3d 1358, 1361 (Fed. Cir. 2007) (“When a patentee defines a claim term, *the patentee’s definition governs, even if it is contrary to the conventional meaning of the term.*”) (emphasis added). A few examples make the point, but the usage is ubiquitous. *See* ’714 patent at 1:39-42 (Overview) (“variable blazed gratings operate to

reflect or *diffract* signals . . .”) (emphasis added); *id.* at 12:56-58 (same). Likewise, the term “reflection” is consistently used throughout the patent to describe what happens to the signal when the mirrors are flat. *See, e.g., id.* at 8:34-36 (“In reflection mode . . . apparatus 110 substantially reflects input optical beam 20 back in the same direction as output beam 24.”).¹⁵ The term “diffraction” is consistently used throughout the patent to describe what happens to the signal when the mirrors are angled. *See id.* at 8:37-39 (“In diffraction mode, apparatus 110 diffracts input optical beam 20 primarily in the direction as indicated by output rays 30 and 32.”).¹⁶ Accordingly, because claims 18 and 19 describe the operation of the device in “reflection mode,” the patentee’s own lexicography requires that the grating be in a parallel position. To allow otherwise (*i.e.*, allowing the grating to “reflect” while in an angled position) would be inconsistent with the terms of the claims.¹⁷

This conclusion is confirmed by the ’714 patent’s grandparent application, which adopts the same lexicography and draws the same distinction between reflection mode and diffraction mode. *Compare* ’714 grandparent, cl. 51 [Ex. F] (“resulting in a **diffraction** of a majority of the

¹⁵ *See also* ’714 patent at 9:47-54 (“In a reflection mode . . . blazed grating apparatus 115 receives optical input beam 20, and reflects beam 20 at an angle equal to the angle of incidence of beam 20. . . . In a diffraction mode of operation, all strips 14 partially rotate toward substrate 12.”).

¹⁶ *See also* ’714 patent at 8:55-58 (“This, in turn, operates to partially rotate strip 114, causing diffraction of the majority of input beam 20”); *id.* at 10:23-27 (“In operation, blazed grating apparatus 120 receives optical beam 20, in this case at a normal incident angle, and diffracts optical beam 20 so that a majority of the diffracted beam travels in one direction as shown by output rays 30 and 32.”); *id.* at 14:23-25 (“In diffraction mode, blazed grating 10 is displaced to position 14” at an angle THETA from position 14’.”); *id.* at 14:18-22 (“blazed grating 10 is displaced to position 14” at an angle THETA to its original position 14’ The majority of input optical beam 20a is diffracted in a single direction”).

¹⁷ Cheetah identifies only a single line from the specification to suggest that the term “reflection” should not be construed in a manner consistent with its use throughout the remainder of the patent. *See* Pl. Br. at 20 (quoting ’714 patent at 4:38-45). This excerpt, however, is inapt because it is discussing the reflection of signals off of *individual strips* in a grating device. But “reflection mode” is defined in terms of how the *entire* “apparatus [] operat[es].” ’714 patent at 4:9-37. With respect to the operation of “a plurality of at least partially reflective mirrors,” as is the case in claim 18 of the ’714 patent, the patent is clear that they “reflect” when they are in a parallel position and “diffract” when in an angled position.

first input signal toward a second output”) *with* ’714 grandparent, cl. 1 [Ex. F] (“resulting in a **reflection** of a majority of the input signal toward an output”) *with* ’714 patent, cl. 18 (“resulting in a **reflection** of the at least some of the portion of the first signal part”) (emphases added). As these related patents share common terms, the terms must be interpreted consistently. *See NTP*, 418 F.3d at 1293 (“Because NTP’s patents all derive from the same parent application and share many common terms, we must interpret the claims consistently across all asserted patents.”).

Claims 18 and 19 claim only *reflection* mode, not *diffraction* mode. Given the specific definitions of the terms “reflection mode” and “diffraction mode,” the use of the different terms in the claims of the grandparent and the ’714 patent must mean something. Cheetah’s proposed construction, however, allows the grating to “reflect” while in an angled position, thereby ignoring the distinctions between the two terms in the specification and the grandparent’s claims. In contrast, Defendants’ construction remains faithful to the lexicography used throughout the patents and, therefore, should be adopted.

D. “light pipe” [claim 18]

Cheetah’s Construction	Defendants’ Construction
An optical fiber or a <i>waveguide</i> .	“fiber-optic line”

The parties disagree as to whether the term “light pipe” means fiber-optic lines (Defendants’ position) or also should include a “waveguide” (Cheetah’s position).

Defendants’ construction is consistent with “the ordinary meaning of the words in their normal usage in the field of invention at the time of the invention.” *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361 (Fed. Cir. 2003). “Light piping” is commonly understood to mean the “[u]se of *optical fibers* to illuminate.” *Newton’s Telecom Dictionary* 514 (16½th ed. 2000) [Ex. U] (emphasis added). In fact, the textbook cited by Cheetah as extrinsic evidence in its Rule 4-3 disclosures confirms this interpretation. *See* Jeff Hecht, *Understanding Fiber Optics* at 3 [Ex. V] (“the idea of light piping reappeared again and again until it finally coalesced into the *optical fiber*”) (emphasis added); *id.* at 2 (“[People] may just need to pipe light from place to place, for communicating, viewing, illuminating, or other purposes. That’s when they need fiber optics.”).

Importantly, the specification supports Defendants’ construction and not Cheetah’s. For example, it provides that the function performed by the “light pipe” in the claims — “communicating at least the first signal part for processing,” *id.* at 25:43-44 (claim 18) — is carried out by a “single mode fiber,” *id.* at 20:31-32, and a “fiber optic tap,” *id.* at 20:36-39, 21:6-10, both of which constitute “fiber-optic lines.” Cheetah does not identify a single instance in the specification where “light pipe” is used to mean anything other than a fiber-optic line. Instead, Cheetah relies on specious prosecution history arguments that should be rejected for the reasons discussed above in Section I.

Finally, Cheetah’s construction would “create[] more ambiguity than it corrects.” *SFA Sys. LLC v. Infor Global Sys. (Mich.), Inc.*, 2009 WL 440559, at * 9 (E.D. Tex. Feb. 23, 2009). The word “waveguide” is not defined or used in either the specification or the prosecution history of the ’714 patent, nor is it defined in the extrinsic evidence cited by Cheetah. Accordingly, construing the term “light pipe” to mean “a waveguide” would not provide any clarity for the jury.

E. “an array of optical signal processing devices” [claims 18, 19]

Cheetah’s Construction	Defendants’ Construction
“A plurality of mirrors arranged in a regular pattern that process the optical signal.”	“an array of variable blazed gratings”

The parties disagree as to whether the array of optical signal processing devices must consist of “variable blazed gratings” (Defendants’ position) or may consist simply of a plurality of mirrors (Cheetah’s position).

In the ’714 patent, the “signal processing devices” are all variable blazed gratings, as is clear from the title of the patent, “Variable Blazed Grating Based Signal Processing.” The ’714 patent’s Overview describes the invention as “*a variable blazed grating*, [which] implements a movable diffraction grating that can be selectively displaced to cause a majority of the diffracted input to travel in a particular direction.” ’714 patent at 1:36-39 (emphasis added). The variable blazed grating is the *only* “optical signal processing device” disclosed in the ’714 patent directed at the “facilitat[ion] of high-speed optical processing.” *Id.* at 1:30-31; Figs. 1-16. In fact, the

term “blazed grating” appears *145 times* throughout the patent. These statements describe the *invention, not* the preferred embodiments of that invention. *See Ciena Corp.*, 2006 WL 1133798, at *11 (emphasis added) (“Statements found in the summary portion of the specification are not limited to describing a preferred embodiment of the invention *but more broadly describe the overall invention itself.*”) (citation omitted). Although a patent may generally claim more than its preferred embodiments, it may not claim more than the invention itself. *See On Demand*, 442 F.3d at 1338 (“In general, the scope and outer boundary of claims is set by the patentee’s description of his invention.”).

Cheetah — ignoring the repeated references to “variable blazed grating” throughout the patent — offers a construction that is far broader than the title, overview, embodiments, and drawings of the ’714 patent can sustain. It attempts to support its construction by relying on two excerpts from the patent (Pl.’s Br. at 10), but these portions confirm that the “variable blazed gratings” are the invention disclosed by the ’714 patent, rather than mere preferred embodiments. The sections Cheetah has cited simply establish that the variable blazed grating-based apparatus can have non-rectangular and varying-width strips while still remaining a variable blazed grating-based apparatus. Accordingly, rather than “make clear that ‘variable blazed gratings’ are only one of many possible configurations for the array” (Pl.’s Br. at 10), the excerpts establish only that different kinds of variable blazed gratings are encompassed by the invention.¹⁸

In addition to being inconsistent with the specification, Cheetah’s proposed construction also would render the patent invalid. Because the variable blazed grating is the only “optical signal processing device” enabled by the ’714 patent, Cheetah’s construction calls into question whether the claims are properly described and/or enabled. *See On Demand*, 442 F.3d at 1340 (“[T]he role of the specification is to describe and enable the invention. In turn, the claims

¹⁸ The only other “support” that Cheetah identifies for its construction is based on the discussion of certain display prior art references during the prosecution history. This argument, however, should be rejected for the reasons discussed above at Section I.

cannot be of broader scope than the invention that is set forth in the specification.”). If possible, “claim language should generally be construed to preserve validity.” *Tate Access Floors, Inc. v. Interface Architectural Res., Inc.*, 279 F.3d 1357, 1367 (Fed. Cir. 2002). Accordingly, Defendants’ construction, which does not render the patent invalid, should be adopted.

F. “moveable reflector” [claims 18, 19]

Cheetah’s Construction	Defendants’ Construction
A mirror that moves as a result of an applied voltage.	“a variable blazed grating”

The parties disagree as to whether the “moveable reflector” must be a variable blazed grating (Defendants’ position) or can be any type of mirror (Cheetah’s position). The term “moveable reflector” appears in the claims, but never once in the specification of the patent.

Cheetah asserts that “[t]here is no dispute that the claimed ‘moveable mirror’ is a mirror that moves as a result of an applied voltage” (Pl.’s Br. at 17), but this argument suffers from multiple flaws. *First*, claims 18 and 19 use the term “moveable reflector,” even though the term “mirrors” also appears in those claims. ’714 patent, cl. 18 & 19. Therefore, the term “moveable reflector” must mean something other than “mirror.” *See BENQ Am. Corp.*, 533 F.3d at 1371 (Fed. Cir. 2008) (“Different claim terms are presumed to have different meanings”). *Second*, the *only* moveable mirrors discussed in the specification are part of a very specific MEMS device — the “variable blazed grating” that lends its name to the title to the ’714 patent.

The only “support” Cheetah identifies for its construction is the following:

Moreover, although particular configuration has been described with respect to FIGS. 10a-10d, numerous modifications could be made without departing from the scope of the invention. For example, switches implementing different geometric configurations, or different numbers of blazed grating elements, circulators, reflective surfaces, or other optical elements are contemplated as being within the scope of the invention.

’714 patent at 14:58-65. This paragraph, however, does not support Cheetah’s construction. As an initial matter, it nowhere discloses that “reflective surfaces, or other optical elements” are capable of moving as a result of an applied voltage. Moreover, it provides no enabling

disclosure of what any “moveable reflector” would do as part of a system with other elements.¹⁹

Finally, Defendants’ construction, unlike Cheetah’s, preserves the validity of the claims. Figures 11g and 11h, which provide the only examples in which a reflecting device that moves is used in tandem with moveable mirrors, use two variable blazed grating devices. And both of the embodiments noted by Cheetah in which a mirror moves as a result of an applied voltage — column 7, lines 29-41 and column 8, lines 15-28 — relate to variable blazed gratings. Thus, the term “moveable reflector” only has any support in the specification to the extent that it is construed to mean a variable blazed grating. Otherwise, the claim is invalid for failure of written description and/or enablement.

G. “first signal part; second signal part” [claims 18, 19]

Cheetah’s Construction	Defendants’ Construction
To separate an optical signal into at least two parts, for example, into two or more wavelengths	“first and second copies of the ‘ <i>unmodulated optical signal</i> ’” (Claims 18, 20) “first and second copies of the input ‘ <i>optical signal</i> ’” (Claim 19)

The parties disagree as to whether the “parts” created by the “separating” step in the ’714 patent must be copies (Defendants’ position) or whether they can be any “two or more wavelengths” (Cheetah’s position).

The only embodiment of the ’714 patent that involves both “separating” and “dividing,” as required by claims 18 and 19, is Figure 15. In this embodiment the signal is split into copies. As the specification explains, the system that communicates the signals sends “one copy of the signal . . . to [the] demultiplexer . . . and sends another copy of the signal . . . to [the] delay line.” ’714 patent at 21:6-10; Fig. 15. In fact, an excerpt that Cheetah quotes even indicates that the two separated parts must be copies:

Fiber optic tap 1018 receives optical signals 1012 and sends one *copy* of the signal including at least header information 1014 to demultiplexer 1024, and

¹⁹ “Moveable reflector” was included in the claims to overcome prior art rejections. Office Action (Jan. 17, 2007) [Ex. W]; Response (Apr. 17, 2007) [Ex. G]. The examiner stated that this limitation was the reason for allowance. Notice of Allowance (June 25, 2007) [Ex. X].

sends another *copy* of the signal including at least payload information 1016 to delay line 1022.

'714 patent at 21:6-10 (emphasis added). Although Cheetah contends that a “copy” may not be a “copy” because it may only include the header or payload information, this argument is plainly unsupported. Nothing in Figure 15 or the accompanying text suggests that the “copies” are different from each other; indeed Figure 15 simply shows a “tap” on the optical line that does not selectively remove anything. As such, the separated parts are “copies” of one another.

H. “output interface” [claims 18, 19]

Cheetah’s Construction	Defendants’ Construction
“the portion of the system that receives the output signal”	“output port for connecting to another system or device”

Defendants incorporate by reference their arguments with respect to this term in the '862 patent. *See* Section II.I. An “interface” by its nature “interfaces” with something.

The '714 patent specification provides further support for Defendants’ construction. The term “output” is used in the patent’s discussion of optical switches, which operate to route data signals to different locations. *See, e.g.*, '714 patent at 12:65-67, 12:38-40, 14:27-31. If Cheetah were correct that the “output” interface could be a terminus, as opposed to a connection with another system or device, the entire purpose of an optical switch — conveying the signal to another location — would be defeated. Cheetah identified no support for its position.

Finally, although the term “output interface” does not appear in the specification, the term “output ports” is used. *See, e.g., id.* at 15:13-15 (“Circulator 806 directs input optical beam 820a to output port 806 for pass through operation”). Indeed, the system of Figure 15, which Cheetah conceded contains every element of the claims, results in “transmit[ing] switched optical signals 1040 to other network elements.” *Id.* at 20:67-21:2 (emphasis added); *accord id.* at 21:29-32. Because “output port” is the nearest term to “output interface” found in the claims, the clear meaning of the term “output port” in the specification is carried into the claim term.

CONCLUSION

For the foregoing reasons, Defendants respectfully submit that the Court should adopt each of Defendants’ proposed constructions.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that all counsel of record who have consented to electronic service are being served with a copy of this document via the Court's CM/ECF system per Local Rule CV-5(a)(3) on this the 10th day of August 2009. Any other counsel of record will be served by first class U.S. mail on this same date.

s/Michael E. Jones

Michael E. Jones